

# ROYAL GARDENS, KEW.

## BULLETIN

OF

## MISCELLANEOUS INFORMATION.

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### CCCCLXXXII.—AI CAMPHOR.

(*Blumea balsamifera*, D.C.)

(WITH PLATE.)

An evergreen shrubby composite, sometimes growing into a small tree, is very abundant in Eastern India, where it is often "a most common and troublesome weed." It is found also in South China and the islands of Hainan and Formosa. The whole plant is woolly, with the flowers on the stout branches of a large spreading or pyramidal panicle. The pappus is red. The leaves smell strongly of camphor. The species is described in Hooker's *Flora of British India*, iii., p. 270, and figured in *Hooker's Icones Plantarum*, t. 1957. In the latter the following note is quoted from Dr. Henry: "From this is produced in Kwangtung and Hainan the peculiar camphor known to the Chinese as *ngai-fên*, signifying the crude product, and *ngai-p'ien*, the name given to the refined article. The export from the port of Hoihow in Hainan of the crude camphor is about 15,000 lbs. annually. This is refined in Canton, from which there is an annual export of about 10,000 lbs. of *ngai-p'ien*. Hanbury (*Science Notes*, p. 394) gives an account of the camphor, and mentions that the plant in question is well known to emit when bruised a strong odour of camphor, and that in Burmah a crude camphor is extracted from it. For the physical and chemical properties of this peculiar camphor, see *Pharmaceutical Journal*, ser. 3, vol. iv., pp. 710-712."

In the following letter Dr. Henry describes the details of the process employed by the Chinese in extracting the camphor from this plant in the Island of Hainan.

DR. A. HENRY, F.L.S., to ROYAL GARDENS, KEW.

Takow, Formosa,

January 27, 1893.

DEAR MR. DYER,

SOME time ago Mr. Ridley, of Singapore, asked me to find out the details of the process, employed by the Chinese in Hainan, for the extraction of *Ai* Camphor from *Blumea balsamifera*, D.C. He had tried to obtain the camphor by distillation from the leaves of the plant, but had only succeeded in getting an oil. Through the kind offices of Mr. Unwin of the Chinese Customs at Hoihow, I have received the following interesting account of the process from the Rev. F. P. Gilman,



and I send it to you for insertion in the *Kew Bulletin*. Mr. Gilman is a member of the American Presbyterian Mission, stationed in Kiung-chow, the capital of Hainan, and he makes journeys from time to time in the interior of the island, which is inhabited by the *Loi*, a non-Chinese race.

"During a recent missionary journey I travelled the entire length of the Loi country, and collected two specimens of the leaves of the plant from which the camphor is distilled, and in several places I saw the natives manufacturing the article, and I had a chance to inquire carefully into the process.

"The plant is in flower in July and August. During the fall and winter months the Chinese of the island, or the aboriginal Loies in Chinese employ, collect the young leaves of the plant which there grows to a height of 8 or 10 feet. They say they only take the last three joints of the branch, as in the specimens which I have collected. These leaves are allowed to remain on the branch, and are wilted for a couple of days. They are then placed in the retort, which is a cask about two feet high, open at both ends, and of a diameter suitable to place it over a large Chinese frying pan (say, the diameter is 20 inches). The frying pan is filled with water, and over the water is placed a coarse sieve of woven bamboo to separate the leaves from the water. The cask is cemented with clay to the edge of the pan, and after receiving its charge of 30 lbs. or 40 lbs. of the leaves, a large brass basin is placed on the upper open end of the cask, and is filled with cold water which is frequently changed. Fire is placed under the frying pan, and the process of distillation is continued for about four hours. At the end of that time the brass pan is lifted off, and its lower surface is found to be coated with a layer of crystallized substance about a sixteenth of an inch thick. This is the *gnia-hün* (local dialect for *ai-fén*) or crude camphor, which Mr. Unwin, the Commissioner, tells me is sent to Canton and re-manufactured into *ai-p'ien* or refined camphor."

I enclose Mr. Gilman's specimen, which is not *Blumea balsamifera*, but, as well as I can make out from a cursory examination, is probably a species of *Buddleia*. There are no flowers, only leaves, and the latter have no camphoraceous odour when bruised. I am inclined to think that Mr. Gilman has been deceived as to the plant, and that the Chinese substituted the leaves of another plant for the one actually employed. I am inclined to think that *Blumea balsamifera* is the true source. The leaves of *Blumea* have a certain rude similarity to those sent by Mr. Gilman.

The authority for *Blumea* as the source of this peculiar camphor rests on Hanbury, *Science Papers*, p. 394. In *Hooker's Icones Plantarum*, tab. 1957, this plant is figured, and some particulars as regards the trade in the commodity, &c. are given there from me.

Yours, &c.

(Signed) AUGUSTINE HENRY.

For the following further information Kew is indebted to Mr. M. F. A. Fraser, H.M. Consul, Pakhoi, who communicated it, together with a series of specimens for the Museum, in a letter dated 5th December 1893.

A.—TRANSLATION from the *Pen-ts'ao Kang muh*, or great Materia Medica, by Li Shi-chen, date about 1600 A.D.

Thousand-year *ngai* (*Blumea balsamifera*), grows originally at Wu-tang (? in Hupeh Province, lat. 32° 40', long. 111° 08'), and in



Tai Ho Hills (? in Anhui Province, lat.  $33^{\circ} 10'$ , long.  $115^{\circ} 43'$ ), has a somewhat slender stalk somewhat over a *chih* (about 14 inches) long. The root is like that of the *p'êng-hao* (*Chrysanthemum coronarium*\*?), its leaves are rather more than a *ts'un* ( $1\frac{1}{2}$  inch) long, and are without points (*i.e.*, simple or entire). The faces of the leaves are dark (or green), the backs white. In autumn the flowers open, yellow, like the wild chrysanthemum,† and small. The seeds (or fruits) are like dark pearls and look like little lumps of cinnabar (?). During the dog-days of summer the leaves are gathered and dried. The leaves are not like those of the *ngai* (*Artemisia vulgaris*), but have the same odour. When triturated they crumble to dust at once, and do not make a soft mass holding together like the leaves of the *ngai* when similarly treated. The Taoists use them to make up prescriptions. Doctors administer them boiled in water for female complaints and for colds in men (?).

B.—NOTES obtained from various sources on the subject of Ngai Camphor.

The *ai*, called *Ta fuh* (great happiness) *ai*, is a plant which grows pretty well over the Kwangsi, Yünnan, and Kweichow Provinces, but the choicest quality is produced at a place called Ta Kang Fow, about 32 miles (100 *li*) from Yünnan Fu, the capital city of Yünnan.

Processes of preparation :—

1. A large pan or cauldron is filled with water, and a tin or can without a lid set upright in it. This tin has a small aperture beneath, into which is fitted a metal tube. The plant is put into the tin, and a second iron pan put over the tin like a cap. This pan has an aperture through which issues the tube leading from the can. The water is made to boil, and the steam, having no other means of egress but the tube, passes through the can and out of the covering iron pan, steaming the plant on its way, and condensing as “*ai* dew.”

2. In the second place the “*ai* dew” is put into a tin or can which has no orifice in it, and, with that variation, treated as before. The product is called *ai fen* (or “*ai* flour” or “powder”).

3. The “*ai* powder” is treated according to the first of the three processes, and the essence thus distilled is the fragrant *ai yu*, or “*ai* oil.”

C.—The following account was given by a Chinese dealer from Kwangsi, who came to Pakhoi in September 1893, to Chen-Sien-Sheng, Her Majesty Consulate's Chinese writer.

Small *ngai* is otherwise called “5th month *ngai*,” and “duck's foot *ngai*,” the *Pen-ts'ao* calls it *ngai*, also “white *ngai*” (*Artemisia vulgaris*).

Great *ngai*, vulgar name “great-luck *ngai*”; in the *Pen-ts'ao* it is called “1000-year *ngai*” (*Blumea balsamifera*).

(Signed) M. F. A. FRASER.

Pakhoi, Dec. 1893.

#### EXPLANATION OF PLATE.

1. Capitulum. 2. Female floret. 3. Disk floret. 4. Seta of pappus.
5. Anthers. 6. Stigma. *Enlarged.*

\* So rendered by Giles. See Brettschneider, *Botanicon Sinicum*, 1892, p. 253 (No. 436).

† See Brettschneider, p. 77. Apparently *Pyrethrum indicum*.



### CCCCCLXXXIII.—BOTANICAL NOMENCLATURE.

At the recent meeting of the British Association at Ipswich, the Director of the Royal Gardens, in the course of his presidential address on September 12th, at the opening of the new Botanical Section K, made the following remarks on the subject of botanical nomenclature.

#### NOMENCLATURE.

There is one subject upon which, from my official position elsewhere, I desire to take the opportunity of saying a few words. It is that of nomenclature. It is not on its technical side, I am afraid, of sufficient general interest to justify my devoting to it the space which its importance would otherwise deserve. But I hope to be able to enlist your support for the broad common-sense principles on which our practice should rest.

As I suppose, everyone knows we owe our present method of nomenclature in natural history to Linnæus. He devised the binominal, or, as it is often absurdly called, the binomial system. That we must have a technical system of nomenclature I suppose no one here will dispute. It is not, however, always admitted by popular writers who have not appreciated the difficulty of the matter, and who think all names should be in the vernacular. There is the obvious difficulty that the vast majority of plants do not possess any names at all, and the attempts to manufacture them in a popular shape have met with but little success. Then, from lack of discriminating power on the part of those who use them, vernacular names are often ambiguous; thus Bullrush is applied equally to *Typha* and to *Scirpus*, plants extremely different. Vernacular names, again, are only of local utility, while the Linnean system is intelligible throughout the world.

A technical name, then, for a plant or animal is a necessity, as without it we cannot fix the object of our investigations into its affinity, structure, or properties.\* “*Nomina si nescis perit et cognitio rerum.*”

In order to get clear ideas on the matter let us look at the logical principles on which such names are based. It is fortunate for us that these are stated by Mill, who, besides being an authority on logic, was also an accomplished botanist. He tells us:† “A naturalist, for purposes connected with his particular science, sees reason to distribute the animal or vegetable creation into certain groups rather than into any others, and he requires a name to bind, as it were, each of his groups together.” He further explains that such names, whether of species, genera, or orders, are what logicians call connotative: they *denote* the members of each group, and *connote* the distinctive characters by which it is defined. A species, then, connotes the common characters of the individuals belonging to it; a genus, those of the species; an order, those of the genera.

But these are the logical principles which are applicable to names generally. A name such as *Ranunculus repens* does not differ in any particular from a name such as John Smith, except that one denotes a species, the other an individual.

This being the case, and technical names being a necessity, they continually pass into general use in connection with horticulture, commerce, medicine, and the arts. It seems obvious that, if science is to keep in touch with human affairs, stability in nomenclature is a thing not merely

\* *Linn. Phil.*, 210.

† *System of Logic*, i. 132.



to aim at but to respect. Changes become necessary, but should never be insisted on without grave and solid reason. In some cases they are inevitable unless the taxonomic side of botany is to remain at a standstill. From time to time the revision of a large group has to be undertaken from a uniform and comparative point of view. It then often occurs that new genera are seen to have been too hastily founded on insufficient grounds, and must therefore be merged in others. This may involve the creation of a large number of new names, the old ones becoming henceforth a burden to literature as synonyms. It is usual in such cases to retain the specific portion of the original name, if possible. If it is, however, already preoccupied in the genus to which the transference is made, a new one must be devised. Many modern systematists have, however, set up the doctrine that a specific epithet once given is indelible, and whatever the taxonomic wanderings of the organism to which it was once assigned, it must always accompany it. This, however, would not have met with much sympathy from Linnæus, who attached no importance to the specific epithet at all: "Nomen specificum sine generico est quasi pistillum sine campana."\* Linnæus always had a solid reason for everything he did or said, and it is worth while considering in this case what it was.

Before his time the practice of associating plants in genera had made some progress in the hands of Tournefort and others, but specific names were still cumbrous and practically unusable. Genera were often distinguished by a single word; and it was the great reform accomplished by Linnæus to adopt the binominal principle for species. But there is this difference. Generic names are unique, and must not be applied to more than one distinct group. Specific names might have been constituted on the same basis; the specific name in that case would then have never been used to designate more than one plant, and would have been sufficient to indicate it. We should have lost, it is true, the useful information which we get from our present practice in learning the genus to which the species belongs; but theoretically a nomenclature could have been established on the one-name principle. The thing, however, is impossible now, even if it were desirable. A specific epithet like *vulgaris* may belong to hundreds of different species belonging to as many different genera, and taken alone is meaningless. A Linnean name, then, though it consists of two parts, must be treated as a whole. "Nomen omne plantarum constabit nomine generico et specifico."† A fragment can have no vitality of its own. Consequently, if superseded, it may be replaced by another which may be perfectly independent.‡

It constantly happens that the same species is named and described by more than one writer, or different views are taken of specific differences by various writers; the species of one are therefore "lumped" by another. In such cases, where there is a choice of names, it is customary to select the earliest published. I agree, however, with the late Sereno Watson § that "there is nothing whatever of an ethical character inherent in a name, through any priority of publication or position, which should render it morally obligatory upon anyone to accept one

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\* *Phil.*, 219.

† *Phil.*, 212.

‡ As Alphonse de Candolle points out in a letter published in the *Bull. de la Soc. bot. de France* (xxxix.), "the real merit of Linnæus has been to combine, for all plants, the generic name with the specific epithet." It is important to remember that in a logical sense the "name" of a species consists, as Linnæus himself insisted, in the combination, not in the specific epithet, which is a mere fragment of the name, and meaningless when taken by itself.

§ *Nature*, xlvii., 54.



name rather than another." And in point of fact Linnæus and the early systematists attached little importance to priority. The rigid application of the principle involves the assumption that all persons who describe or attempt to describe plants are equally competent to the task. But this is so far from being the case that it is sometimes all but impossible even to guess what could possibly have been meant.\*

In 1872 Sir Joseph Hooker† wrote: "The number of species described by authors who cannot determine their affinities increases annually, and I regard the naturalist who puts a described plant into its proper position in regard to its allies as rendering a greater service to science than its describer when he either puts it into a wrong place or throws it into any of those chaotic heaps, miscalled genera, with which systematic works still abound." This has always seemed to me not merely sound sense, but a scientific way of treating the matter. What we want in nomenclature is the maximum amount of stability and the minimum amount of change compatible with progress in perfecting our taxonomic system. Nomenclature is a means, not an end. There are perhaps 150,000 species of flowering plants in existence. What we want to do is to push on the task of getting them named and described in an intelligible manner, and their affinities determined as correctly as possible. We shall then have material for dealing with the larger problems which the vegetation of our globe will present when treated as a whole. To me the botanists who waste their time over priority are like boys who, when sent on an errand, spend their time in playing by the roadside. By such men even Linnæus is not to be allowed to decide his own names. To one of the most splendid ornaments of our gardens he gave the name of *Magnolia grandiflora*: this is now to be known as *Magnolia fœtida*. The reformer himself is constrained to admit, "The change is a most unfortunate one in every way."‡ It is difficult to see what is gained by making it, except to render systematic botany ridiculous. The genus *Aspidium*, known to every fern-cultivator, was founded by Swartz. It now contains some 400 species, of which the vast majority were of course unknown to him at the time; yet the names of all these are to be changed because Adanson founded a genus, *Dryopteris*, which seems to be the same thing as *Aspidium*. What, it may be asked, is gained by the change? To science it is certainly nothing. On the other hand, we lumber our books with a mass of synonyms, and perplex everyone who takes an interest in ferns. It appears that the name of the well-known Australian genus *Banksia* really belongs to *Pimelea*: the species are therefore to be renamed, and *Banksia* is to be rechristened *Sirmuelleria*, after Sir Ferdinand von Mueller; a proposal which, I need hardly say, did not emanate from an Englishman.

I will not multiply instances. But the worst of it is that those who have carefully studied the subject know that, from various causes which I cannot afford the time to discuss, when once it is attempted to disturb accepted nomenclature it is almost impossible to reach finality. Many genera only exist by virtue of their redefinition in modern times; in the form in which they were originally promulgated they have hardly any intelligible meaning at all.

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\* Darwin, who always seems to me, almost instinctively, to take the right view in matters relating to natural history, is (*Life*, vol. i. p. 364) dead against the new "practice of naturalists appending for perpetuity the name of the *first* describer to species." He is equally against the priority craze:—"I cannot yet bring myself to reject very *well-known* names" (*ibid.*, p. 369).

† *Flora of British India*, i. vii.

‡ *Garden and Forest*, ii. 615.



It can hardly be doubted that one cause of the want of attention which systematic botany now receives is the repulsive labour of the bibliographical work with which it has been overlaid. What an enormous bulk nomenclature has already attained may be judged from the *Index Kewensis*, which was prepared at Kew, and which we owe to the munificence of Mr. Darwin. In his own studies he constantly came on the track of names which he was unable to run down to their source. This the *Index* enables to be done. It is based, in fact, on a manuscript index which we compiled for our own use at Kew. But it is a mistake to suppose that it is anything more than the name signifies, or that it expresses any opinion as to the validity of the names themselves. That those who use the book must judge of for themselves. We have indexed existing names, but we have not added to the burden by making any new ones for species already described.

What synonymy has now come to may be judged by an example supplied me by my friend Mr. C. B. Clarke. For a single species of *Fimbristylis* he finds 135 published names under six genera. If we go on in this way we shall have to invent a new Linnæus, wipe out the past, and begin all over again.

Although I have brought the matter before the Section it is not one in which this, or indeed any collective assembly of botanists, can do very much. While I hope I shall carry your assent with the general principles I have laid down, it must be admitted that the technical details can only be appreciated by experienced specialists. All that can be hoped is a general agreement amongst the staffs of the principal institutions in different countries where systematic botany is worked at; the free-lances must be left to do as they like.

#### CCCCCLXXXIV.—NEW ORCHIDS.—DECADE 15.

141. *Dendrobium curviflorum*, Rolfe; caule erecto brevi, foliis equitantibus lanceolatis subacutis carnosis, floribus axillaribus solitariis, bracteis ovatis subobtusis fasciculatis, sepalo postico ovato-oblongo obtuso lateralibus similibus basi in mentum curvum obtusum longe extensis, petalis lineari-oblongis obtusis, labello obovato-cuneato retuso, disco lævi, columna brevissima pede longo incurvo.

HAB.—Himalaya mountains, and probably Sikkim.

Caulis 6 poll. longus. Folia  $1\frac{1}{2}$ – $1\frac{3}{4}$  poll. longa, 3 lin. lata. Bractea 1– $1\frac{1}{2}$  lin. longæ. Pedicelli 7–8 lin. longi. Sepalum posticum  $5\frac{1}{2}$  lin. longum, lateralia 1 poll. longa. Petala 5 lin. longa. Labellum 1 poll. longum. Columna 1 lin. longa. Mentum 9 lin. longum.

A member of the section *Aporum* with unusually large flowers, being as much as  $1\frac{3}{4}$  inches long, white with a faint pink suffusion on the back of the sepals, and a yellow line down the centre of the lip terminating in a deeper blotch in front. It first flowered with Mr. James O'Brien in October 1892.

142. *Cirrhopetalum compactum*, Rolfe; cæspitosum, pseudobulbis oyoideis monophyllis, foliis elliptico-oblongis obtusis carnosis sessilibus, scapis gracilibus paucifloris, floribus subumbellatis nutantibus, bracteis lineari-lanceolatis acuminatis, sepalo postico oblongo-lanceolato acuto



concavo glabro lateralibus oblongo-linearibus obtusis, petalis triangulari-ovatis acutis glabris, labello sagittato-oblongo obtuso, columna brevissima dentibus brevibus.

HAB.—Tenasserim: Panga, *Curtis*.

*Pseudobulbi* 3–4 lin. longi. *Folia* 1–1½ poll. longa, 4–5½ lin. lata. *Scapus* 2¼ poll. longus. *Bractea* 1½ lin. longæ. *Pedicelli* 1½ lin. longi. *Sepalum* posticum 2 lin. longum; lateralia 5½–6 lin. longa. *Petala* 1½ lin. longa. *Labellum* 1 lin. longum.

A small species sent to Kew by Mr. C. Curtis, of the Forest Department, Penang, which flowered in September last. It is allied to *C. parvulum*, Hook. f., and *C. acutiflorum*, Hook. f. Flowers uniformly pale straw-coloured.

143. *Trias vitrina*, *Rolfe*; rhizomate repente, pseudobulbis approximatis ovoideis monophyllis, foliis subsessilibus oblongo-lanceolatis subacuminatis carnosius, floribus solitariis v. fasciculatis breviter pedicellatis, sepalo postico ovato acuto erecto apice recurvo lateralibus ovatis acutis supra medium reflexis, petalis subspathulato-oblongis acutis erectis, labello trilobo lobis lateralibus parvis falcato-subulatis erectis intermedio oblongo subobtusulo amplo reflexo, disco convexo supra basin bicarinato, columna brevissima crassissima apice rostrata.

HAB.—Tenasserim; Panga, *Curtis*.

*Pseudobulbi* 6–10 lin. longi. *Folia* 2½–3½ poll. longa, 5–8 lin. lata. *Pedicelli* 6 lin. longi. *Sepalum* posticum 7 lin. longum, 5 lin. latum; lateralia 8 lin. longa, 4 lin. lata. *Petala* 2¼ lin. longa. *Labellum* 6 lin. longum, 2½ lin. latum. *Columna* 2 lin. longa.

Sent to Kew with the preceding *Cirrhopetalum*. Sepals a very pale shining green, and the apex of the petals and base of the lip marked with red-brown. Leaves longer and more acute and the flowers larger than in the previously known species.

144. *Cœlogyne Veitchii*, *Rolfe*; pseudobulbis fusiformi-oblongis demum angulatis diphyllis, foliis lanceolato-oblongis acutis subcoriaceis, scapis pendulis multifloris basi vaginatis, bracteis obovato-oblongis subacutis convolutis, sepalo postico lanceolato-oblongo acuto carinato concavo suberecto, lateralibus connatis lanceolato-oblongis acutis carinatis conduplicato-concavis erectis, petalis lanceolatis acutis reflexis, labello trilobo basi saccato lobis lateralibus amplius rotundatis columnam involventibus intermedio late orbiculari-ovato acuto recurvo, disco basi obtuse tricarinato apice lævi, columna brevi clavata dilatato-alata apice subtruncata crenulata.

HAB.—Western New Guinea, *Burke*.

*Pseudobulbi* 3½–4 poll. longi. *Folia* 5–7 poll. longa, circa 1½ poll. lata. *Scapi* ½–2 ped. longi. *Bractea* 6–8 lin. longæ. *Pedicelli* 6–8 lin. longi. *Sepala* 6 lin. longa. *Petala* 5 lin. longa. *Labellum* 6–7 lin. longum. *Columna* 3 lin. longa.

A very distinct species, which flowered in the establishment of Messrs. James Veitch & Sons in August last. Flowers pure white, borne in long pendulous racemes. The short column, the absence of markings on the lip, and the very short rather obscure basal keels are quite different from any previously known species.

145. *Polystachya Kirkii*, *Rolfe*; pseudobulbis cæspitosis lineari-oblongis subteretibus monophyllis, foliis sessilibus lineari-oblongis acutis, scapis gracilibus interdum parce ramosis paucifloris basi ancipitibus,



bracteis triangulari-lanceolatis acutis, sepalo postico lanceolato-ovato acuto lateralibus late triangularibus carinatis apice subfalcatis acutis, petalis lanceolatis acutis, labello trilobo intus pubescente lobis lateralibus parvis semioblongis obtusissimis erectis intermedio ovato acuto, callo lineari-oblongo valde carnosio pubescente, columna lata.

HAB.—East Tropical Africa: Mombasa district, *Sir John Kirk*.

*Pseudobulbi*  $1\frac{1}{4}$ –2 poll. longi. *Folia* 3–5 poll. longa, 7–10 lin. lata. *Scapi* 2–3 poll. longi. *Bractea*  $1-1\frac{1}{4}$  lin. longæ. *Pedicelli*  $2-2\frac{1}{2}$  lin. longi. *Sepalum* posticum  $3\frac{1}{2}$  lin. longum,  $1\frac{1}{2}$  lin. latum; lateralialia 4 lin. longa, 4 lin. lata. *Petala*  $3\frac{1}{2}$  lin. longa, 1 lin. lata. *Labellum*  $3\frac{1}{4}$  lin. longum,  $2\frac{1}{2}$  lin. latum. *Columna* 1 lin. longa.

A very distinct species, allied to *P. lawrenceana*, Kränz. It first flowered in the Kew collection in June 1894. Flowers white with a faint suffusion of pale green; front lobe of the lip margined with light purple. Readily distinguished from its allies by the shape of the pseudobulbs, the flattened scapes, and the shape and colour of the flowers.

146. *Lueddemannia triloba*, *Rolfe*; pseudobulbis ovoideo-oblongis, foliis lanceolatis acutis, scapis pendulis brevibus multifloris nigro-puberulis, bracteis oblongis obtusis concavis, pedicellis nigro-puberulis, sepalo postico elliptico-oblongo obtuso concavo lateralibus paullo latoribus, petalis oblongo-lanceolatis subobtusis, labello trilobo basi cuneato concavo lobis lateralibus rotundatis obtusis intermedio triangulari acuto, disco medio unidentato basi unidentato, columna clavata alis parvis late rotundatis carnosius.

Hab.—Andes of S. America.

*Pseudobulbi* circa  $2\frac{1}{2}$  poll. longi. *Folia* circa 1 ped. longa. *Scapi* 6–7 poll. longi. *Bractea* 3–5 lin. longæ. *Pedicelli* 6–7 lin. longi. *Sepala* 9–10 lin. longa, posticum 5 lin. latum, lateralialia 6 lin. lata. *Petala* 9–10 lin. longa, 4 lin. lata. *Labellum* 10 lin. longum, 9 lin. latum. *Columna* 9 lin. longa.

This flowered in the collection of Sir Trevor Lawrence, Bart., in July last. Distinguished from the two species previously known by the short rounded side lobes of the lip, with more saccate base, and the much shorter scapes. Sepals light yellow lightly suffused with madder brown, petals deep yellow; lip orange-yellow, with a few madder brown marks at the extreme base.

147. *Catasetum uncatum*, *Rolfe*; pseudobulbis fusiformi-oblongis foliatis, foliis lanceolatis v. oblongo-lanceolatis acuminatis plicatis, florum ♂ scapis erectis v. arcuatis multifloris, bracteis lanceolato-oblongis acutis, sepalis petalisque subpatentibus oblongo-lanceolatis acutis concavis, submembranaceis, labello galeato apice inflexo subacuto lobis lateralibus amplis rotundatis denticulatis, columna clavata antennis longis subparallelis, florum ♀ scapis erectis paucifloris, bracteis ut in ♂, sepalis petalisque patentibus v. reflexis oblongo-lanceolatis acutis planiusculis carnosius, labello galeato ore integro, columna brevissima ecirrhusa.

HAB.—Brazil: prov. Pernambuco.

*Pseudobulbi* 3–8 poll. longi. *Folia* 10–14 poll. longa,  $1\frac{1}{2}$ – $2\frac{1}{2}$  poll. lata. *Scapi* 1–2 poll. longi. *Bractea* 4–7 lin. longæ. *Pedicelli*  $1-1\frac{1}{2}$  poll. longi. *Sepala* et *petala* fl. ♂ 10–15 lin. longa. *Labellum* 5–7 lin. longum. *Columna* 4–6 lin. longa. *Sepala* et *petala* fl. ♀ 7–8 lin. longa. *Labellum* 7–8 lin. longum. *Columna* 3 lin. longa.



This was sent home with *Cattleya labiata*, Lindl., and has flowered in several different collections. Messrs. F. Sander & Co. had both sexes, which were presented to Kew. Allied to *C. albovirens*, Rodr., but the sepals and petals of the male flowers are twice as long as the lip, and sometimes more, while the front of the lip is curved round into a subacute apex. The flowers of both sexes are light green.

148. *Catasetum apertum*, Rolfe; pseudobulbis fusiformi-oblongis, foliis lanceolatis acuminatis, scapis suberectis paucifloris, bracteis lanceolatis oblongis subacutis, sepalis lanceolato-oblongis acutis concavis subpatentibus incurvis, petalis late elliptico-oblongis subobtusis concavis incurvis, labello supero galeato apice trilobo lobis lateralibus amplis rotundatis recurvis subintegris intermedio late triangulari obtuso sacco subhemisphærico, columna clavata rostrata antennis in planis diversis divergentibus.

HAB.—Not known.

*Pseudobulbi* 4–5 poll. longi. *Folia* 4–7 poll. longa,  $1\frac{1}{4}$ –2 poll. lata. *Scapi* circa 6 poll. longi. *Bractea* 6 lin. longæ. *Pedicelli* 1 poll. longi. *Sepala*  $1\frac{1}{2}$  poll. longa, 7 lin. lata. *Petala*  $1\frac{1}{2}$  poll. longa, 1 poll. lata. *Labellum* 1 poll. longum,  $1\frac{3}{4}$  poll. latum; saccus  $\frac{1}{2}$  poll. altus. *Columna* 1 poll. longa; antennæ 8 lin. longæ.

A striking species belonging to the section *Eucatasetum*. It flowered in the collection of Sir Charles Strickland, Bart., in September, 1894. Allied to the Ecuadorean *C. macroglossum*, Rehb. f., still only known from the description, but it has no large semicircular transverse keel in front of the lip, as in that. Sepals and petals a very light apple green, with a few minute light brown spots; lip yellowish green, densely spotted and marbled with warm shining brown, and becoming wholly suffused with red brown inside the sac. Female flowers are unknown.

149. *Scelochilus carinatus*, Rolfe; cæspitosus, foliis lanceolato-linearibus acutis, scapis brevibus, racemis pendulis circa 7-floris, bracteis lineari-lanceolatis acuminatis, sepalo postico suberecto oblongo-lanceolato subobtusato carinato conduplicato-concavo lateralibus ad medium connatis subpatentibus basi in saccum obtusum productis cæteris similibus, petalis suberectis lineari-oblongis acutis apice reflexis, labello unguiculato, limbo reflexo orbiculari-obcordato basi bicalloso, lobis lateralibus in medio unguis falcato-incurvis, columna clavata pubescente angulis supra medium dilatatis.

HAB.—Andes of S. America, *Lehmann*.

*Folia* 3–4 poll. longa. *Scapi* 2 poll. longi. *Bractea* 3–4 lin. longæ. *Pedicelli* 6–7 lin. longi. *Sepala* 8 lin. longa, saccus  $1\frac{1}{2}$  lin. longus. *Petala* 5 lin. longa. *Labellum* 5 lin. longum. *Columna* 4 lin. longa.

This flowered in the collection of Sir Trevor Lawrence, Bart., in September last. Sepals light yellow; petals maroon-purple above with a white margin, lined with white and purple below; lip and column white, with a maroon-purple blotch at the base of the reflexed limb of the former.

150. *Saccolabium hainanense*, Rolfe; caule erecto distichophyllo, foliis lanceolato-linearibus subacutis carnosius subcarinatis canaliculatis, scapis horizontalibus v. deflexis paniculatis, bracteis oblongo-lanceolatis acutis, floribus secundis parvis numerosis, sepalis oblongis obtusis, petalis



oblongis obtusis, labellò obovato-oblongo obtuso crasso-carnoso, calcare oblongo, columna brevissima.

HAB.—Hainan, *Rev. B. C. Henry*.

*Caules*  $\frac{1}{2}$  ped. alti v. ultra. *Folia*  $1\frac{1}{2}$ – $2\frac{1}{4}$  poll. longa,  $2\frac{1}{2}$ –4 lin. lata. *Scapi* 3–6 poll. longi. *Bractee*  $\frac{3}{4}$  lin. longæ. *Pedicelli*  $1-1\frac{1}{4}$  lin. longi. *Sepala* 1 lin. longa. *Petala*  $\frac{3}{4}$  lin. longa. *Labellum*  $1\frac{1}{2}$  lin. longum; calcar vix 1 lin. longum.

Allied to the Himalayan *Saccolabium gemmatum*, Lindl., but the leaves are nearly flat, not subterete, and more than twice as broad. Flowers white, with the exception of the petals and dorsal sepal, which are lilac-purple. The plant was sent by Mr. Ford from the Hongkong Botanic Garden to Kew, where it flowered in March last.

### CCCCCLXXXV.—BEGONIA DISEASE.

Cultivators of tropical herbaceous plants, such as Gloxinias, *Achimenes*, *Pentas*, *Impatiens*, Vincas, and especially Begonias, have recently become familiar with a "disease" which attacks these plants, sometimes crippling and practically destroying whole collections in a few weeks. It attacks chiefly the young leaves and flower-buds, causing the latter to wither and fall off, and the leaves to curl and become aborted. When the disease is bad, the youngest leaves are arrested in growth when very small, and the whole plant soon presents a hopelessly crippled appearance. The mature leaves are discoloured with patches of a black or brown colour, as if suffering from a rust-fungus of some kind.

The general impression with regard to the nature of this disease was that it is fungoid. Attention was called to it recently in the *Gardeners' Chronicle* for September 7 last in a paper on "Tuberous Begonias," by Mr. W. W. Sheath (pp. 267, 268), who stated that "Pot-plants (of Begonias) are sometimes infested with a kind of rust on the stems and leaves, which some growers say is a fungus, but I have found it more prevalent when in too much heat in spring; also by sudden changes of temperature or draughts; by imperfect drainage—in fact, by anything that would cause a check in the growth." On p. 305 there is a note signed "W. K.," wherein this disease is attributed to "large numbers of white insects, barely visible to the naked eye." Another correspondent, however, "H. W. C.," who says (p. 337) that he is an extensive grower of Begonias, does not believe that the small white insects are the cause of this rust-like disease, but inclines to believe that it is caused by a fungus.

A similar discussion has been going on concurrently in the pages of the *Garden*. The Assistant Curator of the Royal Gardens has been acquainted with this disease for some years, and at first thought it was due to some kind of rust-fungus, but now considers it to be caused by a very small insect or mite, so small as to be invisible to the naked eye. It runs very quickly, and therefore often soon leaves a leaf or shoot if disturbed. This no doubt accounts for the failure of experts to find the insect when specimens of the disease have been submitted to them.

By lightly fumigating once a week with tobacco the plants subject to the attacks of this pest, we have now no difficulty in keeping our Begonias clean; indeed, tobacco fumigation appears to be a perfect preventive, and almost a certain cure, if the plants have not been



hopelessly crippled before it is applied. This year a batch of Acanthaceous plants, such as *Justicias*, *Aphelandras*, &c., had been suffering from this particular disease for some weeks before it was noticed. The gardener in charge of the plants thought a fungus was the cause of the curling and discoloration of the foliage. By frequently dipping the affected plants in a weak solution of tobacco, the plants were, in most cases, saved, and have since quite recovered.

Every cultivator knows how easily irregularity of temperature or atmospheric moisture will bring on an attack of red-spider or thrips among plants grown under glass, and this mite, which is smaller than either of the two pests named, and at least as quick-spreading and injurious in its effects on the health of the plant, can get a start from the same cause, viz., bad ventilation or some other fault in the atmosphere in the house containing the plants.

Certain forms of black blotching and leaf-curling which often disfigure *Masdevallias* of the *Chimæra* section and some others besides, are the work of an almost invisible insect, probably a relation of the mischievous little red-spider. It must be sought for very carefully, and when discovered it requires some care and perseverance to get rid of it.

Specimens of the diseased plants were submitted to a well-known authority who obligingly furnished the following report:—

MR. A. D. MICHAEL, F.L.S., to ROYAL GARDENS, KEW.

DEAR SIR,

Cadogan Mansions, Sloane Square,  
November 5, 1895.

THERE is not any doubt what the mite on your leaves is, nor any doubt that it is the cause of the damage. It is a *Tarsonymus*, the species is probably unrecorded; I think it most resembles *Kirchneri*, but is intermediate between that and *buxi*. I could make certain if it be either of these species if you wish it, but probably the minute differences would not interest you. The creatures of this genus escaped observation altogether until a few years since, in consequence of their minute size and mode of life; they are still very imperfectly known. They are all most destructive, attacking healthy plants and soon reducing them to a very bad condition. *Tarsonymus buxi* practically destroyed all the foliage of the box trees in some of the Italian Botanical Gardens a few years since, and in the *Kew Bulletin* for April 1890, p. 85, you will find a report of my own upon sugar-cane from Barbados which was seriously injured from the same cause (species different).

I fear I cannot give any very confident assistance in the eradication of the pest. These Acari are leaf-mining things which burrow in between the two surfaces of the leaf and thus get protected. They are most difficult to eradicate; probably the best methods will be to spray the plants from below so as to reach the under surfaces of the leaves, frequently, at short intervals, with such solutions of soap and sulphur, or benzol, or carbolic acid as the respective plants will bear. Plants which will stand it might be plunged in solution of fluid carbolic acid, 3 or 4 oz. to the gallon of water. Badly infected plants and all debris which is infected should be destroyed at once by fire or boiling water. Spraying healthy plants with solution of carbolic acid, even if very weak, would probably render them distasteful to the *Acarus*, if the plants will stand it without injury.

Yours truly,  
(Signed) ALBERT D. MICHAEL.



CCCCCLXXXVI.—RAFIA FROM WEST AFRICA—  
(continued.)

A brief account was given in the *Kew Bulletin*, 1895 (pp. 88–92), of the production of the material known as Rafia, from species of palms in West Africa. This fibre has hitherto been exclusively obtained from Madagascar. It is used for tie bands by gardeners, as well as for making mats and decorative articles.

A sample of West African Rafia, obtained from the leaflets of *Raphia vinifera*, locally known as the Bamboo palm, was brought to Kew by Mr. Henry Millen, Curator of the Botanic Station at Lagos, in August last. The following reports were obtained on this sample:—

Messrs. IDE and CHRISTIE to ROYAL GARDENS, KEW.

72, Mark Lane, London, E.C.,  
September 4, 1895.

DEAR SIR,

YOUR favour of yesterday and samples to hand. The latter show just as we formerly experienced, bad colour (*i.e.*, brown in lieu of creamy white), very short (one sample was longer), all stringy, not flat-open. The trade, unless in famine, would not entertain it; appearance goes a long way nowadays, although for some tying purposes, this West Coast product should do as well as the Madagascar.

If asked for a value, we would hazard 20*l.* per ton.

Yours faithfully,  
(Signed) IDE and CHRISTIE.

D. Morris, Esq., C.M.G., D.Sc.,  
Royal Gardens, Kew.

Messrs. J. A. NOBLE & Co. to ROYAL GARDENS, KEW.

136, Fenchurch Street, London, E.C.,  
September 6, 1895.

DEAR SIR,

WE are favoured with your letter of the 3rd instant, with sample of Lagos Rafia. We are desirous of showing this to the consumers as well as to the dealers. With the latter there will be difficulty in getting them to put it forward in the place of the Madagascar Rafia, as it is not so sightly and the smaller buyers will prefer the broader and lighter colour. Our own opinion is that with more care in the preparation it will come into use with those who do not look to colour so much as strength. We see no reason why it may not be broader, as it has simply been allowed to curl up in the preparation, and is consequently harsh, with a tendency to cut in the using. It is certainly the strongest we have seen from the West Coast; what we have seen before has been soft and good colour, but very tender and unsaleable.

We will write you again after we have given the consumers an opportunity of testing it and have received their opinion upon it. In the meantime, Mr. Millen should continue his experiments, and we feel no doubt he will be able to improve considerably on this sample. There is very little doing at the present time, and prices have fallen back from 48*l.* per ton to 32*l.* nominal. We consider this should sell at about 20*l.* per ton on the basis of 32*l.* for the Madagascar.

Yours truly,  
(Signed) J. A. NOBLE & Co.

D. Morris, Esq., C.M.G., D.Sc.,  
Royal Gardens, Kew.



As already mentioned small shipments of West African *Rafia* have been made, from time to time, for many years, but no commerce has arisen in it owing to its unfavourable character as compared with Madagascar *Rafia*. The natives all along the coast manufacture cloths, mats, baskets, and hammocks from *Rafia*, and samples are in the Kew Museums from the Gambia, Sierra Leone, Gold Coast, and Old Calabar.

Further specimens of *Rafia* from West Africa were brought to Kew recently by Mr. Walter Haydon, Curator of the Botanic Station at the Gambia. The plant yielding these has not yet been determined. It is evidently a species of *Raphia*, but different in the fruit from any *Raphia* so far represented at Kew. Mr. Haydon's specimens of *Rafia* were soft in texture and of good colour, but rather short. They were, however, superior to any specimens previously received from West Africa. The following Report shows also, that they were valued commercially at a higher price than any former specimens:—

Messrs. IDE and CHRISTIE TO ROYAL GARDENS, KEW.

72, Mark Lane, London, E.C.,

November 14, 1895.

DEAR SIR,

REGARDING the sample and letter dated 13th from the Royal Gardens duly to hand, we beg to say that for colour and texture, this is the best *Rafia* we have seen from the West Coast of Africa, and in these respects equal to the Madagascar product. The uncut ends, shortness and fine points all are against the sale and would interfere both with sale and value.

As it is we put it about 20*l.* to 25*l.* per ton. A small shipment of the usual West Coast we sold a few days ago at 25*l.*

Yours faithfully,

(Signed) IDE and CHRISTIE.

D. Morris, Esq., C.M.G., D.Sc.,  
Royal Gardens, Kew.

## CCCCCLXXXVII.—DIAGNOSES AFRICANÆ, IX.

The small collection, of which the following are the new species, was made by Mr. Alexander Carson in 1894, opposite the south end of Lake Tanganyika. The novelties of his previous collections in the same region are described in "Diagnoses Africanæ," IV. (*Kew Bulletin*, 1895, pp. 63-75). Lake Mweru is about a hundred miles long, and is situated about a hundred miles west of the south end of Tanganyika. It is 2,900 feet above sea-level, and the Kalongwizi river runs into it from the east. A good map of the district will be found in the *Proceedings of the Royal Geographical Society* (vol. xiv., 1892), illustrating a paper by Mr. Alfred Sharpe. It belongs to the South Central region, as defined in Oliver's *Flora of Tropical Africa*, the botany of which is still almost entirely unknown. The whole collection contains between 40 and 50 species.

401. *Boscia Carsoni*, Baker [Capparidæ]; fruticosa, ramosissima, glabra, foliis distincte petiolatis oblongis obtusis basi cuneatis coriaceis utrinque pallide viridibus, floribus in racemos densos multifloros termi-



nales dispositis, pedicellis erecto-patentibus calyce longioribus, sepalis oblongis persistentibus post anthesin reflexis, staminibus circiter 15 calyce paulo longioribus antheris parvis oblongis, gynophoro staminibus æquilongo, ovario ovoideo stigmate sessili peltato.

*Habitat*.—Mwero plateau, west of Lake Tanganyika, *Carson*, 37 of 1894 collection.

*Folia*  $1\frac{1}{2}$ –2 poll. longa, medio 12–14 lin. lata. *Sepala* 2 lin. longa. *Fructus* ignotus.

Near *B. senegalensis*, Lam.

402. *Ochna floribunda*, *Baker* [Ochnaceæ]; fruticosa, ramulis lignosis glabris, foliis breviter petiolatis oblanceolato-oblongis ciliatis glabris e medio ad basin sensim attenuatis post anthesin maturis, cymis multis sessilibus umbellatis multifloris, bracteis parvis congestis ovatis membranaceis, pedicellis calyce longioribus, sepalis oblongis obtusis rubro-brunneis glabris post anthesin reflexis, petalis obovato-cuneatis calyce paulo longioribus, filamentis brevibus antheris magnis linearibus, stylo elongato.

*Habitat*.—Near Lake Mwero, west of Lake Tanganyika, *Carson*, 8 of 1894 collection.

*Sepala*  $2\frac{1}{2}$  lin. longa. *Petala* 3 lin. longa. *Fructus* ignotus.

Near *O. leptoclada*, Oliver.

403. *Dolichos platypus*, *Baker* [Leguminosæ]; herbaceus, perennis, caule stricto erecto, stipulis linearibus rigidis persistentibus, petiolo late alato alis rigidulis basi cordatis apice rotundatis stipellis mucronatis persistentibus, foliis simplicibus oblongo-lanceolatis acutis rigidulis glabris, floribus paucis laxè racemosis, pedicellis erecto-patentibus pubescentibus calyce longioribus, calycis tubo brevi campanulato dentibus tubo longioribus superioribus deltoideis inferioribus lanceolatis, petalis glabris rubellis calyce duplo longioribus, ovario cylindrico multiovulato.

*Habitat*.—Mwero plateau, west of Lake Tanganyika, *Carson*, 11 of 1894 collection.

*Caulis* sesquipedalis. *Alæ* petiolorum 2 poll. longæ, 5–6 lin. latæ. *Folia* 3–4 poll. longa, 10–12 lin. lata. *Calyx* 3 lin. longus. *Vexillum* 6–8 lin. longum.

A very curious species, nearly allied to *D. pteropus*, *Baker*, in *Kew Bull.*, 1895, p. 66.

404. *Kalanchoë pilosa*, *Baker* [Crassulaceæ]; annua, caule erecto pilis mollibus brevibus subtilibus albis patulis vestito, foliis sessilibus oblongo-lanceolatis acutis integris utrinque pilosis, floribus in paniculam amplam dispositis ramis erecto-patentibus apice dense cymosis, pedicellis brevibus pilosis, calycis campanulati pilosi lobis ovatis tubo æquilongis, corollæ pallide luteæ tubo calyce triplo longiore dimidio superiore cylindrico dimidio inferiore dilatato, limbi segmentis obovato-cuneatis, genitalibus in tubo inclusis, staminibus biserialis prope medium tubi insertis.

*Habitat*.—Mwero plateau, west of Lake Tanganyika, *Carson*, 3 of 1894 collection.

*Caulis* pedalis et ultra. *Folia* caulina 1– $1\frac{1}{2}$  poll. longa. *Calyx* 2 lin. longus. *Corollæ* tubus 6 lin. longus; limbus expansus 4 lin. diam.

Near *K. glandulosa*, Hochst.



405. *Combretum (Poivraea) mweroense*, *Baker* [Combretaceæ]; ramulis dense pubescentibus, petiolis brevissimis dense pilosis, foliis oblongis acutis basi breviter cordatis utrinque dense pubescentibus, floribus pentameris dense cymosis, calycis tubo subcylindrico dense piloso dentibus parvis lanceolatis, petalis parvis viridibus, staminibus longe exsertis, fructu oblongo obtuso ad basin attenuato angulis late alatis.

*Habitat*.—Mwero plateau, west of Lake Tanganyika, *Carson*, 37, in part, of 1894 collection.

*Folia* 2 poll. longa. *Calycis* tubus 8 lin. longus. *Stamina* quam calyx 5–6 lin. longiora. *Fructus* 18 lin. longus.

406. *Pentas modesta*, *Baker* [Rubiaceæ]; annua, herbacea, caule erecto ramoso, ramulis pubescentibus, stipulis conspicue ciliatis, foliis linearibus acutis glabris integris sessilibus ad basin attenuatis, cymis terminalibus laxis paucifloris, pedicellis brevissimis, ovario demum glabro, dentibus calycinis linearibus subæqualibus persistentibus fructui æquilongis, corollæ tubo cylindrico dentibus calycinis paulo brevioribus, fructu subgloboso.

*Habitat*.—Kalongwizi river, Mwero, west of Lake Tanganyika, *Carson*, 33 of 1894 collection.

*Folia* centralia 2 poll. longa, 3–4 lin. lata. *Dentes calycini* demum  $2\frac{1}{2}$  lin. longi. *Corollæ* limbus expansus 4 lin. diam.

407. *Vernonia subaphylla*, *Baker* [Compositæ]; perennis, caule erecto parce ramoso pubescente ad collum radice dense lanoso, foliis paucis parvis linearibus sessilibus integris subcoriaceis pilosis facie canaliculatis, capitulis ad apices ramorum solitariis multifloris, involucri campanulato, bracteis obtusis imbricatis adpressis pilosis exterioribus sensim brevioribus interioribus margine membranaceis rubellis, floribus rubro-purpureis, acheniis angulatis pubescentibus, pappo albido setoso corollæ tubo brevioribus.

*Habitat*.—Kalongwizi river, Mwero, west of Lake Tanganyika, *Carson*, 10 of 1894 collection.

*Caulis* pedalis. *Folia* 6–12 lin. longa. *Involucrum* 6 lin. longum. *Pappus* 3 lin. longus.

408. *Senecio (Kleinia) mweroensis*, *Baker* [Compositæ]; caule brevi cylindrico carnosio inermi, foliis minutis linearibus integris acutis carnosius, pedunculis nudis erectis strictis elongatis, capitulis homogamis multifloris, involucri oblongo bracteis circiter 12 lanceolatis glabris æqualibus, pappo molli albo corollæ tubo æquilongo, limbi lobis luteis lanceolatis.

*Habitat*.—Kalongwizi river, Mwero, west of Lake Tanganyika, *Carson*, 15 of 1894 collection.

*Pedunculi* 4–6 poll. longi. *Involucrum* 10 lin. longum, 6 lin. diam. *Pappus* 10–11 lin. longus.

Near *S. Antephorbium*, Sch. Bip.; *Bot. Mag.* tab. 6099.

409. *Dicoma quinquenervia*, *Baker* [Compositæ–Mutisiaceæ]; perennis, caule simplice stricto erecto elongato tenuiter albo-incano, foliis caulinis distantibus linearibus vel lanceolatis integris subcoriaceis basi caulem vaginantibus facie viridibus dorso albo-incanis, e basi supra medium conspicue quinquenerviis, capitulis paucis magnis aggregatis,



involucro campanulato bracteis omnibus adpressis linearibus acuminatis subcoriaceis albidis nitidis exterioribus sensim brevioribus, pappo molli albo multiseriali dense plumoso corollæ tubo æquilongo.

*Habitat.*—Hills near the Chama River, Mwero, west of Lake Tanganyika, *Carson*, 4 of 1894 collection.

*Caulis*  $1\frac{1}{2}$ –2 pedalis. *Folia* centralia semipedalia, 12–18 lin. lata. *Involucrum* 15–16 lin. longum. *Pappus* 6 lin. longus.

Near *D. sessiliflora*, Harv.

410. *Ipomœa* (*Strophipomœa mweroensis*, *Baker* [Convolvulaceæ]; caule gracili volubili pilis subtilibus patulis vestito, foliis patulis distantibus integris cordato-ovatis acutis facie viridibus obscure pilosis dorso vinoso-purpureis magis pilosis, cymis 2–3-floris breviter pedunculatis, pedicellis elongatis, bracteis parvis lanceolatis, sepalis ovato-lanceolatis æqualibus pilosis, corollæ albæ infundibularis limbo patulo vix lobato extus fasciis 5 pubescentibus percurso, staminibus brevibus prope basin tubi insertis.

*Habitat.*—Mwero plateau, west of Lake Tanganyika, *Carson*, 23 of 1894 collection.

*Folia* 15–18 lin. longa. *Calyx* 3–4 lin. longus. *Corolla* 15 lin. longa, limbo expanso 15–18 lin. diam.

Near *I. obscura*, Ker.

411. *Ipomœa* (*Strophipomœa*) *pharbitiformis*, *Baker* [Convolvulaceæ]; caule volubili gracili adpresse pubescente, foliis breviter petiolatis cordato-ovatis integris acutis facie viridibus parce pilosis dorso pilis mollibus adpressis pallide brunneis dense persistenter vestitis cymis 5–6-floris breviter pedunculatis, pedicellis brevibus, bracteis magnis ovato-lanceolatis pilosis, sepalis ovato-lanceolatis acutis æqualibus imbricatis pilosis, corollæ saturate rubro-purpureæ limbo vix lobato, staminibus brevibus prope basin tubi insertis.

*Habitat.*—Mwero, west of Lake Tanganyika, *Carson*, 41 of 1894 collection.

*Folia* 2–3 poll. longa. *Sepala*  $4\frac{1}{2}$  lin. longa. *Corolla* 18 lin. longa, limbo expanso 15–18 lin. diam.

Near *I. Lindleyi*, Choisy.

412. *Coleus punctatus*, *Baker* [Labiatae]; perennis, caulibus validis erectis elongatis pubescentibus, foliis longe petiolatis ovatis acutis inciso-crenatis membranaceis basi late rotundatis utrinque viridibus pubescentibus dorso copiose minute nigro-punctatis, cymis multifloris subracemosis in paniculam subdensam oblongam dispositis, pedunculis pedicellisque pilosis, calycis tubo brevissimo dense piloso dentibus ovatis supremo multo majore, corollæ tubo supra medium decurvato ampliato, labio superiore parvo erecto, inferiore saccato unguiculato, staminibus labio inferiore æquilongis.

*Habitat.*—Mwero plateau, west of Lake Tanganyika, *Carson*, 25 of 1894 collection.

*Petiolis* 2–2 $\frac{1}{2}$  poll. longi. *Folia* 3–4 poll. longa, 2–2 $\frac{1}{2}$  poll. lata. *Panicula* semipedalis. *Calyx* fructiferus 2 lin. longus. *Corolla* 9 lin. longa.

413. *Coleus leucophyllus*, *Baker* [Labiatae]; perennis, caule stricto erecto elongato persistenter albo-incano, foliis breviter petiolatis oblongis subacutis crenatis basi cuneatis facie tenuiter dorso dense persistenter albo-incanis, racemis compositis in paniculam amplam densam dispositis, cymis multifloris distincte pedunculatis, pedicellis brevibus pubescentibus, bracteis parvis caducis, calycis pubescentis tubo campanulato dentibus omnibus ovatis acutis supremo majore, corollae tubo supra medium decurvato ampliato, labio superiore parvo erecto trilobato, inferiore magno profunde saccato longe unguiculato, staminibus labio inferiori æquilongis.

*Habitat*.—Near Mwero, west of Lake Tanganyika, *Carson*, 26 of 1894 collection.

*Caulis* tripedalis. *Folia* inferiora 3–4 poll. longa, medio 18–21 lin. lata. *Panicula* subpedalis. *Calyx* floriferus 3 lin. longus. *Corolla* 12–15 lin. longa.

414. *Plectranthus (Isodon) primulinus*, *Baker* [Labiatae]; perennis, ramis sublignosis elongatis, foliis hysteranthiis ignotis, racemis brevibus densissimis in paniculam oblongam vel globosam congestis, pedicellis brevissimis, calycis dense pilosi tubo campanulato dentibus linearibus æqualibus tubo longioribus, corollae pallide luteæ extus pilosæ tubo curvato calyce paulo longiore, labio superiore parvo erecto, labio inferiore majore orbiculari saccato, staminibus labio inferiori æquilongis.

*Habitat*.—Mwero plateau, west of Lake Tanganyika, *Carson*, 36 of 1894 collection.

*Panicula* 1½–2 poll. longæ. *Calyx* demum 2 lin. longus. *Corolla* 3 lin. longa.

Near *P. densus*, N. E. Brown, in *Kew Bulletin*, 1894, p. 12.

415. *Scutellaria paucifolia*, *Baker* [Labiatae]; perennis, caespitosa, caulibus brevibus dense albido-pubescentibus, foliis paucijugis sessilibus vel breviter petiolatis ovatis obtusis integris vel obscure crenulatis viridibus vel purpureo tinctis utrinque pubescentibus, racemis simplicibus laxis terminalibus paucifloris vel multifloris, foliis floralibus parvis ovatis persistentibus, pedicellis ascendentibus pilosis, calycis valde accrescentis tubo campanulato pubescente dente supremo magno orbiculari reliquis minoribus obtusis, corollae tubo pubescente calyce triplo longiore lobis brevibus latis, genitalibus inclusis.

*Habitat*.—Mwero plateau, west of Lake Tanganyika, *Carson*, 12 of 1894 collection. Lower plateau of Lake Nyassa, *Thomson*.

*Caules* 3–5 poll. longi. *Folia* inferiora 3–4 lin. longa. *Calyx* floriferus 2 lin. longus. *Corolla* 7–8 lin. longa.

416. *Loranthus (Dendrophthoe) mweroensis*, *Baker* [Loranthaceae]; ramulis validis teretibus glabris, foliis distincte petiolatis oblongis subobtusis basi rotundatis coriaceis utrinque viridibus glabris venis primariis gracilibus ascendentibus, cymis lateralibus multifloris breviter pedunculatis, pedicellis brevissimis, bracteis late ovatis calyci æquilongis, calycis campanulati parvi glabri ore truncato, corollae tubo elongato cylindrico limbo ante anthesin globoso lobis late ovatis.

*Habitat*.—Mwero plateau, west of Lake Tanganyika, *Carson*, 27 of 1894 collection.



*Petoli* 9-12 lin. longi. *Folia* 3-4 poll. longa, medio  $1\frac{1}{2}$ -2 poll. lata. *Calyx*  $\frac{3}{4}$  lin. longus. *Corollæ* tubus 15 lin. longus: lobi  $1\frac{1}{2}$  lin. longi.

Near *L. Braunii*, Engler.

417. *Gladiolus* (*Eugladiolus*) *erectiflorus*, Baker [Irideæ]; caule gracili glabro elongato, foliis caulinis 2-3 linearibus glabris elongatis rigide subcoriaceis, spica laxa simplice multiflora, spathæ valvis lanceolatis parvis scariosis, floribus erectis albis venis rubro-purpureis pulchre decoratis, perianthii tubo anguste infundibulari segmentis oblongo-spathulatis subobtusis tubo aequilongis inferioribus angustioribus, staminibus segmentis superioribus paulo brevioribus.

*Habitat*.—Liendwe, west of Lake Tanganyika, Carson, 1 of 1894 collection.

*Cormus* ignotus. *Folia* pedalia vel sesquipedalia, 3-4 lin. lata. *Valva* exterior 12-15 lin. longa. *Perianthium* 2-2 $\frac{1}{4}$  poll. longum.

Near *G. Grantii*, Baker.

## CCCCCLXXXVIII.—SUMACH.

(*Rhus Coriaria*, L.)

There are three sorts of sumach known in commerce. Venetian sumach, or young fustic, consists of the twigs of *Rhus Cotinus*, a southern European species. This yields a beautiful bright yellow dye, much used in calico printing. North American sumach is yielded by *Rhus glabra*. The fruit, leaves, and bark of this tree are used for their astringent properties in tanning leather. The sumach of the Mediterranean region, and the one more widely used, consists of the powdered leaves only of *Rhus Coriaria*, a hardy shrub growing on rocky slopes in Sicily and elsewhere. An interesting account of the cultivation of sumach in the vicinity of Colli, near Palermo, is translated by Colonel H. Yule, C.B., in the *Transactions of the Botanical Society of Edinburgh* (Vol. IX., pp. 341-355), from an article by Professor Inzenga.

The branches of the sumach are cut with a pruning hook or knife of a peculiar shape, called a "ronco," while the leaves after drying in the fields, are threshed with a flail called a "bovillo." These implements were obtained for the Kew Museums with the kind assistance of the Foreign Office, in 1885. (*Pharm. Journ.*, XV. [3], p. 852.)

The sumach plant has been successfully introduced to Australia, and is said to thrive well in the dry plains of the Wimmera district. Sumach from Melbourne plants was shown at the Exhibition of 1863.

In a report by the U.S. Consul at Palermo, dated November 12, 1884, it is stated that the plant attains a height of about 3 feet. It is a shrub with small oval leaves about an inch long. The most favourable locality for the cultivation of the plant is rocky soil on the slopes of hills such as those about Palermo, which are covered with it. The growth of the plant begins in spring, and it ripens its leaves about August. When the sumach is cut, it is spread on the field to dry, the leaves are then broken from the stems, packed in bags, and conveyed to the mills.

"The first process to which it is subjected in the mill is that of cleaning, which consists of placing it in the 'ventila'—a kind of sieve—

to separate from it dirt, stones, snail shells, &c. This is accomplished by a strong current of air induced by hydraulic pressure. The second process is that of grinding, which is similar in many respects to the old way of grinding grain. The third process consists in placing the result of the second in a large sieve, the holes in which are graduated to suit the taste of the country to which it is intended to export the sumach; that for the United States being more finely ground than any other country, the United States preferring fine sumach, and other countries a coarser article."

A recent account of the trade in sumach, which constitutes one of the most important industries in Palermo, is contained in a Foreign Office Report (Annual Series, 1895, No. 1544) by Vice-Consul De Garston of Palermo:—

He states that real sumach, which is known in Sicily as "sommacco forte," or "mascolino," is a hardy shrub which grows upon available patches of ground on the hillsides and the slopes of the mountains. It does not require a good soil, but, on the contrary, is generally found flourishing in the most stony and apparently poor ground. The plant attains a height of about  $1\frac{1}{2}$  feet from the ground, and the leaves closely resemble those of the oak. The harvesting takes place during the months of July, August, and September.

This species of sumach is locally known as "strong" (owing to the greater per-centage of tannin which it yields) in contradistinction to the similar plant known as "sommacco femminello," called also Catania sumach, although in point of fact it is not limited to the province of Catania, but, on the contrary, is very common throughout the whole of the province of Palermo.

The leaves of the latter (femminello) are smaller and of much less strength than those of the former plant, and are, therefore, of considerably less value. They are consequently largely used in the adulteration of the ground sumach.

Two other plants which closely resemble each other, and are named respectively "bruca" and "stinco," are largely used in the sumach trade to adulterate the genuine article. They rise to the height of small trees, and have no leaf, properly speaking. In lieu of the leaf they have prickly little shoots, which thickly cover the lesser branches, and which, after being collected, are ground up and mixed with the product of the true sumach plant. These very inferior articles always contain a large proportion of earth, owing to the impossibility of making them undergo a process of ventilation.

Pure sumach, on the other hand, is capable of being ventilated, and is, in fact, invariably submitted to that operation, and thus freed from much of the impurity in the shape of the native soil, which finds its way into the mills together with the leaf, having been taken up during harvesting.

Of late years there has been a continued falling-off in the quantity of sumach exported, both as regards "leaf" and "ground," the demand being much slacker than formerly. This falling-off in the demand may be a natural sequence of the ever-increasing adulteration in the article, which is now carried on to a great extent, and made a fine art of. What formerly went forward under the name of sumach was really the product of the real plant, with a very small addition of undefined vegetable product; what is now sold as sumach is a mysterious vegetable compound with an infinitesimal quantity of sumach added thereto.



Whether the adulteration which now goes on is a result of the increasing competition all round, and an attempt to sell at anything near the prices offered, or whether it is due to the class of dealers into whose hands the sumach trade has now fallen, is a question which will admit of a great deal of argument.

In 1894 the amount of sumach, ground and in leaf, exported from Palermo to the United Kingdom amounted to 3,469,053 kilos., in round numbers, say, 3,400 tons, and the approximate value of same amounted to 693,810 lire, or in sterling, at exchange 26·50 lire, to 26,181*l.*, whilst the total export of sumach to all countries during same period was 25,562,397 kilos., or about 25,000 tons, of which France alone took some 10,000 tons, mostly in leaf, and America 5,500 tons, Germany coming next with 3,265 tons, or very nearly as much as was taken by Great Britain. The approximate value of all the sumach exported from Palermo to all countries during 1894 was 5,112,479 lire, or in sterling 192,923*l.* 14*s.* 8*d.* at 26·50 lire exchange.

After the sumach leaf has been subjected to the first process of trituration, there remains a certain amount of coarse stuff; this is ground over again, and the product is added to what has been already obtained. Still there is left a certain residuum of unground leaves, stalks, &c., and this residuum is technically known in Sicilian as "peduzzo." The name given to the small stalks branching from the main root of the sumach plant, and to which the leaves are directly attached, is "gambuzzo." These also receive a degree of grinding, and the result is added to the aforesaid "peduzzo" before the latter has been re-ground, but not before it has been sifted, and the coarser ungrindable part set aside to be utilised in its turn as additional and auxiliary fuel in the furnaces.

The price of sumach is generally at its lowest during and immediately after harvesting, when, very naturally, the peasant proprietors are anxious to realise, not being able to defer handling their money and wait for a rise, which is very nearly certain to take place later in the season. It is at this period that the speculator steps in and buys up all that his means will allow, to be stored and locked up till the anticipated rise takes place.

Very frequently the price reached is not sufficiently tempting to induce the holder to part with his stock, in which case the stock will remain on hand till next season, and come on the market together with the new crop. The buying and selling of sumach and its kindred plants is wholly conducted on the basis of the obsolete weights and moneys of Sicily, so many tarì for the cantar of sumach. A tarì is worth 42½*c.*, or, say, 4½*d.*, and 30 tarì go to the "onza," or 12·75 lire, equal to our half sovereign. The cantar weighs exactly 79·342 kilos., being equal to 100 rotoli of 800 grammes each, within a fraction, that is to say, about 2lbs. English.

Although all the transactions in sumach are calculated on the basis of these ancient weights and coins, yet no such moneys are actually in circulation, consequently every calculation has to be reduced again to the decimal system, the currency here, as elsewhere in the kingdom of Italy, being lire and centesimi.

The value of sumach, of course, varies considerably according to the demand and the season.

Last year's prices ruled about 41 to 42 tarì per cantar, or, say, about 21·96 to 22·50 lire per quintal (100 kilos.) delivered free at the mills. These figures, of course, refer to the genuine strong (mascolino) sumach from the best districts. Femminello would be worth about 4 tarì less per cantar; and bruca would sell for, say, 14 to 18 tarì per cantar; stinco from 4½ to 6 lire, and so on. English readers may like to be reminded that the Italian lira is worth about 9*d.* at the present rate of exchange.

Absolutely pure sumach should contain from 30 to 32 per cent. of tannin, determined by the oxalic acid method, or 20 to 22 per cent. tannin as gallo-tannic acid. Pure femminello, on the other hand, would only contain from 22 to 26 per cent. of tannin (oxalic acid), and 16 to 18 per cent. tannin, as gallo-tannic acid. However, perfect purity in sumach is only a chemical expression; it never appears on the market. A satisfactory quality, and one of greater strength than is generally sold, would be two-thirds of genuine strong sumach and one-third femminello, and this should give an average of about 29 per cent. tannin (oxalic acid) and 20 per cent. of tannin as gallo-tannic acid (when properly ground and mixed). The following figures show the value of sumach exported to the United States from Palermo for the year 1894:—

Date.						Value.	
						\$	c.
Quarter ending—							
March 31st	-	-	-	-	-	89,614	78
June 30th	-	-	-	-	-	51,853	12
September 30th	-	-	-	-	-	40,132	50
December 31st	-	-	-	-	-	109,473	78
Total						291,074	18

The last paragraph of the above report has been slightly modified in expression. It is still, however, at first sight not quite intelligible.

Professor Church, F.R.S., has obligingly furnished the following explanation:—"I find that the amount of potassium permanganate required to oxidise 41·6 grams. of gallo-tannic acid is capable of oxidizing 63 grams of oxalic acid. I think that the lower figures in the report were calculated from the oxalic acid figures by reducing them by one-third. The method adopted may be stated thus: 100 parts by weight of sumach are capable of reducing the same amount of permanganate as 30 parts of oxalic acid; it is calculated that this figure corresponds to 20 parts of gallo-tannic acid."

### CCCCLXXXIX.—LIBERIAN COFFEE.

A note with the most recent information on Liberian coffee was published in the *Kew Bulletin*, 1895, p. 273. This also contained a list of articles that have appeared on the subject in the *Bulletin* during the last five years. Where suitable facilities do not exist at the place of production for cleaning Liberian coffee the following information in regard to cleaning it in London will be useful to planters. Messrs. Major and Field, who have favoured Kew with a letter on the subject, have had considerable experience in dealing with shipments of Liberian coffee to this country:—

MESSRS. MAJOR AND FIELD to ROYAL GARDENS, Kew.

Red Lion and Three Cranes Wharf,

Upper Thames Street,

DEAR SIR,

London, E.C., November 14, 1895.

As our letter to you of the 3rd pointed out, the reference in our letter of March 1892, published in the *Kew Bulletin* (1893, pp. 130-132),



was only to shipments of Liberian coffee in the cherry, and not to shipments of Liberian coffee in parchment at all.

We have carefully read the interesting article on Liberian coffee on pp. 261-263 of the *Kew Bulletin* of 1888, which contains Messrs. Lewis and Peat's letter, and we think it is quite compatible with the belief that "it is probable that, under many conditions, being able to ship the coffee in parchment is a facility of considerable importance to growers."

Messrs. Lewis and Peat say in their letter of October 1888, "We certainly think if such results can be obtained on the other side, as shown by your sample from the Tan Hun Guan estate, at Durian Tungal (Malacca), it would be folly to send the coffee home here in parchment." This remark is on the assumption that it is possible to send the produce of estates forward in the same condition as the sample. It has to be borne in mind, however, that a mere sample weighing only a few pounds can be prepared with an amount of attention and care which it may often be commercially impracticable to bestow on an entire crop, and we have in mind the difficulty that cultivators so often experience in preparing their crop (after they have perhaps grown it in the best possible way) to suit the fancy of the buyers.

As regards the remark that "the parchment of this coffee gets very hard and difficult to clean when left long before cleaning," there is no doubt that Liberian parchment is far more difficult to deal with than parchment of the Arabian type, but as the coffee has to be thoroughly dry whether it is cleaned here or abroad, we do not think the parchment really becomes any harder when left long before cleaning, or that the coffee is more difficult to work than it otherwise would have been. The remark would, however, undoubtedly apply to Liberian coffee dried in the cherry, as the cherry husk then becomes exceedingly hard, very much indeed like the shell of a nut, and it was knowledge of this fact, and that coffee forwarded in cherry naturally shows a far higher percentage of loss for shell than coffee sent forward merely in the parchment, that led us to speak so strongly in our letter of March 1892 (*Kew Bulletin*, 1893, pp. 130-132) against shipments of Liberian coffee in cherry. As regards the parcel of Johore Liberian, referred to by Messrs. Lewis and Peat as not having turned out satisfactorily, the fact that it had not been properly dried and was consequently musty, would be sufficient to account for the bad result, as if growers failed to pulp, wash, and dry their produce properly, it is impossible for any amount of care, either on this or the other side, to afterwards remedy the defect.

During the last year or so small lots of Liberian parchment coffee from the west coast of Africa have been sent to us for husking, all of which have been treated without difficulty, and in September last we received a parcel of Borneo Liberian from Messrs. Shand, Haldane, & Co., of 24, Rood Lane, E.C., the secretaries in London of the Borneo Coffee Company, Limited. These gentlemen have furnished us with information as to prices obtained, &c., so that we are able to give fairly full particulars concerning this parcel.

We understand it is the first shipment from the Taritipan estate of the company in British North Borneo, and consisted of B. C. and Co., Limited, 43 bags parchment coffee, and three bags cleaned coffee, which arrived per "Telamon" SS. at Singapore, ex "Banjermassin" SS. at Kudat, Borneo. Messrs. Shand, Haldane & Co., at the time they handed us the Borneo Liberian with instructions to warehouse and clean the coffee, informed us that they anticipated a rather

rough out-turn, as it had been collecting for some time, and the pulpers not having arrived out there, the means of pulping were not adequate. On landing the parcel, we found that there were two distinct qualities of parchment, 17 bags being clean and bright parchment, and 26 bags very rough and dingy, and though we have not full information on the subject, we think there can be little doubt that the latter was some of the first to be gathered, and that the treatment was not thoroughly understood at the time. The two parcels were husked separately, and the 26 bags were found to be much the same style of coffee as the three bags that had been cleaned abroad. The out-turn after husking, sizing, &c., with the prices realised in bond, were as follows :—

	Net Out-turn.			Price per Cwt.	
	Cwts.	Qrs.	Lbs.	s.	d.
Ex 17 bags :—					
Bold - - - - -	8	2	3	89	0
Medium - - - - -	0	2	25	70	0
Bold peaberry - - - - -	0	3	16	75	0
Ex 26 bags :—					
Bold - - - - -	11	1	18	75	6
Medium - - - - -	1	0	26	60	0
Bold and small peas, with small peas ex the 17 bags.	2	0	5	70	0
Triage :—					
Ex 17 bags - - - - -	0	0	19	50	0
Ex 26 bags - - - - -	0	1	7		
3 bags cleaned abroad - - - - -	3	1	25	70	0

The loss in weight on the 43 bags after husking was 32·6 per cent. For purposes of comparison, it will, perhaps, hardly be fair to take account of the 17 bags, as they were so much better in quality than either of the other lots; but, as a rough comparison, the 26 bags may be contrasted with the three bags cleaned abroad. The average price of the 15 cwt. of the former works out at 72s. 11d. per cwt. against 70s. per cwt. realised by the latter, and although we do not pretend that the result of one parcel can be considered conclusive evidence either one way or the other, yet we think it fairly justifies the conclusion that under many conditions being able to ship in parchment may be of considerable importance to producers. That the best pile in the parcel fetched 89s. per cwt. proves that Liberian parchment coffee can be thoroughly well treated over here. The price we charge for cleaning Liberian parchment coffee is 3s. 9d. per cwt., as against 2s. 6d. per cwt. for Arabica parchment, the operation being very much more difficult, and the charge includes all the London warehouse charges that would be incurred if the coffee were sent over after having been cleaned abroad.

Whether it is worth while shipping Liberian coffee in parchment is a question that at least at present we think each individual grower must decide for himself, being guided by local conditions and the circumstances of his own case. A certain amount of labour would be saved which on new estates, and where the labour supply is not plentiful, would be of considerable importance, the hands being set free for other work on the estate. The Europeans in charge would be able to look after the general work of the place, instead of having to superintend the cleaning operations, with the working of which many of them may be



only very imperfectly acquainted. The capital outlay on machinery is reduced, and risks of breaking down avoided. This latter consideration must be most important when the coffee is being cultivated, as it so frequently is, in countries where no engineering shops exist, necessitating even trivial repairs being executed in England. The crop can also probably be shipped a good deal earlier than if it has to be husked on the estate. A disadvantage is that of freight having to be paid on an increased weight. Of course it is absolutely essential that as much care should be taken in the pulping, washing, and drying of coffee intended for shipment in parchment as if it was going to be treated on the spot, otherwise successful results cannot be expected. In this connection we think the paragraph on page 262 of the *Bulletin* for 1888, mentioning that in Java the Liberian coffee cherries are fermented before they are pulped, which it is claimed enables the coffee to be more readily cleaned, and produces coffee brighter in colour and of better quality, is well worth impressing on growers again, so that they may take steps to verify the correctness of this statement, as this possibly accounts for some of the coffee received being a nice bright yellow colour and comparatively free from silver skin, while some is extensively coated with the latter and is dingy and dull in appearance.

In conclusion, we may say we are sure Messrs. Shand, Haldane, & Co. would answer any inquiries you might like to make with reference to the Borneo coffee, and we shall be glad to give you any further information in our power on the subject.

The Director,  
Royal Gardens, Kew.

We are, &c.  
(Signed) MAJOR AND FIELD.

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### CCCCXC.—MISCELLANEOUS NOTES.

The Director of the Royal Gardens represented the Royal Society at the funeral of M. PASTEUR in Paris on October 5.

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**Botanical Magazine.**—The October number opens with *Anthurium Gustavi*, a native of Cauca, Colombia. It was first sent to Kew from Herrenhausen by Dr. Wendland in 1887, but this plant has not flowered; subsequently it was received from Messrs. Sander & Co., of St. Albans, and this plant flowered last year. It is a striking species with huge cordate leaves and long, narrow, deep purple spathes. *Mormodes rolfeanum*, a native of Peru, is a handsome orchid, which flowered at Kew in January of the present year. *Polygala Galpini*, a South African species, with flowers recalling those of *Indigofera decora*. It was raised from seeds sent to Kew by Mr. Galpin in 1889. *Tulipa violacea*, a Persian species, which, in spite of its name, has not violet flowers, though they are of a much richer, brighter hue than they are represented in the figure. It was flowered at Kew from bulbs presented by Mr. Max Leichtlin, of Baden-Baden. *Sternbergia fischeriana* is a spring-flowering species, very similar to *S. lutea*. Bulbs were received at Kew last year from Messrs. Dammann, of Naples, and from Mr. E. Whittall, of Smyrna, near which place they were collected by the latter gentleman.

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**Index Kewensis.**—In the *Bulletin* for 1893, p. 342, the publication of the first part of this important compilation was announced, and some particulars given of its history, scope, and probable date of completion. Happily nothing has occurred to impede the progress of the work, and the last part is in the hands of botanists, within the period originally estimated for passing it through the press. Sir Joseph Hooker and Mr. Daydon Jackson, the principal labourers, are to be heartily congratulated on the accomplishment of this great and arduous undertaking, in which the resources of Kew have played so important a part. As already explained, this index covers the period from the establishment of binominal nomenclature by Linnæus in 1753 down to the end of 1885. This leaves ten years, and ten very active years, of botanical work still unindexed; but it is satisfactory to know that a supplement covering this decade is in a forward state of preparation. M. Th. Durand, of the Royal Herbarium, Brussels, began this supplement some years ago, and even offered the first five years of it to the editors of the *Index Kewensis* for incorporation in that work, but the offer was declined because acceptance would have delayed publication and interfered with the original plan. Steps were taken, however, to encourage and assist M. Durand, and arrangements are in progress for publishing the supplement uniformly with the *Index* itself. Mr. Daydon Jackson is now actively assisting M. Durand, and it is hoped that they will be able to publish during the course of next year.

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**Kew System of Greenhouse Construction.**—The periodical reconstruction of the houses in which plants are grown under glass is a serious drawback to this method of cultivation. It is, however, practically impossible to avoid it as long as wood is employed, as that material sooner or later inevitably decays under the humid conditions to which it is necessarily exposed. To obviate this difficulty iron has for some years been freely used in the construction of greenhouses at Kew. Ordinary T iron is used for the rafters. The sashes which can be easily replaced at any time, if they become decayed, rest conveniently on the arms of the inverted T.

This method of construction has proved perfectly successful, and the Conservatory, No. IV., as well as the Temperate Fern House, No. III., are good examples of the method.

The merits of the system have not escaped the attention of the horticulturists of other countries. The Royal Board of Works and Buildings, Munich, and the Board of Commissioners of the Zoological Gardens, Rotterdam, have severally applied for detailed working drawings of the mode of construction employed in the Kew houses. And these have been furnished accordingly by the First Commissioner of Her Majesty's Works and Public Buildings.

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**Rosa wichuraiana.**—This very distinct and ornamental rose, which has lately been the subject of much praise in the gardening journals, has recently been figured in the *Botanical Magazine* (plate, 7421), under the name of *R. Lucia*, with which species it was formerly associated, when only known from dried specimens. The reduction has been the cause of some questions being addressed to Kew, and it may, therefore, be useful to give the history of the name *wichuraiana*. It was originally given by the eminent rhodologist, Fr. Crépin, to a specimen



in the Berlin Herbarium, but abandoned by himself in favour of the name *Lucia*, first published in the *Bulletin de la Société Royale de Botanique de Belgique* (x., 1871, p. 324), on the assumption that it was the same species. Consequently it has since been cited by many writers as a synonym, without further investigation, though Crépin restored it (*Bull. Soc. Roy. Bot., Belg.*, x., p. 189) to specific rank in 1886. Botanically there is not much to separate *R. multiflora*, *R. Lucia*, and *R. wichuraiana*, though the habit of the latter is extremely different.

Another point has arisen in connection with the figure in the *Botanical Magazine*. In a footnote, it stated that *Rosa Lucia* (but inferentially *R. wichuraiana*), "must have been introduced into England at an earlier period, for there is a good specimen of it in the Kew Herbarium, received from Canon Ellacombe in 1880." The specimen in question is neither *R. Lucia* nor *R. wichuraiana*, but *R. multiflora*, though it bore the first name in gardens until the error was discovered.

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**West Indian Frog at Kew.**—The following account is reprinted from *Nature*, for October 31 (p. 643):—

A short time ago! Mr. W. Watson, the Assistant Curator of Kew Gardens, informed me that he had noticed for several years, in some of the hot-houses, specimens of a small frog, which, hiding away during the day among the pots and orchid-baskets, enlivened the quiet evenings with their shrill whistling notes. Suspecting that this frog must be a foreign importation, I asked the Director to allow some of the specimens to be caught, and some days ago I had the pleasure of receiving three specimens in excellent condition.

The frog is *Hylodes martinicensis*, a small arboreal species, distributed over and common in many West Indian Islands (Martinique, Porto Rico, St. Vincent, Dominica, Barbados, &c., and possibly in Trinidad). Mr. Watson recollects that he observed it first some ten years ago, that he lost sight of it for some time, but that it reappeared about four or five years ago. Taking into consideration the few facts with which we are acquainted as to the reproduction of this frog, it seems most probable that several specimens of both sexes were, on more than one occasion accidentally introduced in Wardian cases.

However that may be, it is evident that the frogs have freely propagated since their introduction. At present they are most numerous in the propagating houses, in which the temperature ranges between 80 degrees and 100 degrees, sinking in winter at times to nearly 60 degrees. Accompanying Mr. Watson one evening I heard from several points the call of the frogs, which somewhat resembled the piping of a nestling bird; and, guided by the sound, I had soon the pleasure of seeing one of them clinging to the side of a glass case.

There is nothing extraordinary in the accidental importation of individuals of a tropical species of frog into Europe, but it is an interesting experience that the species should have permanently established itself. This is owing, in the first place, to the favourable conditions under which it found itself placed, and secondly, to the peculiar mode of its propagation.

*Hylodes martinicensis*, and probably the majority of its congeners, does not spawn in water, but deposits from 15 to 30 ova on leaves in damp places. After a fortnight the young frogs are hatched in a perfect form, having passed through the metamorphosis within the egg, thus

escaping the vicissitudes and dangers to which they would have been exposed during the progress of the usual Batrachian metamorphosis.

This instance of the acclimatisation in Kew Gardens of the 'Coqui' (as the frog is called in Porto Rico) is unique in Batrachian life at present. I trust that the little guest may long flourish where it has found such a congenial home, and where it usefully aids in the destruction of plant-eating insects and wood-lice, of which I found great numbers in the stomach of a specimen. If at a later period a nest with ova were discovered, Mr. Thiselton-Dyer would delight the heart of embryologists, to whom the opportunity of examining fresh ova of this frog would be most welcome.

ALBERT GÜNTHER.

Kew, October 20.

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**"Spot" disease of Orchids.**—This well-known disease has been investigated by a member of the staff, and the results published in the *Annals of Botany*, (vol. ix., 1895, p. 421). When a section through a "spot" is examined under the microscope, spherical bodies are seen in many of the cells; these bodies increase in size and change their shape when in contact with water, thus resembling to some extent the parasite *Plasmodiophora*, but are in reality masses of disorganised cell contents produced by a sudden chill, caused by the presence of minute drops of water on the surface of the leaf at a time when the temperature is below the normal. "Spot" can be produced at will by placing minute particles of ice, or some drops of water on the leaf of an orchid exposed to a temperature of 10–15 degrees F. lower than usual.

The disease of vine leaves known as *Brunissure* or browning, which has been described as due to the presence of a parasite, *Plasmodiophora vitis*, is also shown to be the result of a sudden fall of temperature when the leaves are wet with rain or mist.

The following summary, while indicating the cause, suggests the means for the prevention of "spot" in cultivated orchids. (1) too high a temperature; (2) too much water, and not sufficient air in contact with the roots; (3) watering or spraying with a falling instead of a rising temperature.

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**Arabian objects for Museum.**—Through the liberality of Mr. J. Theodore Bent the Museum of the Royal Gardens has lately become possessed of the following interesting objects from Hadramaut and Oman :—

1. A coffee pot as used at Oman, made of tin and brass and ornamented with a rough kind of chasing. 2. A pipe cut out of a solid piece of stone, and used in Hadramaut for smoking tobacco; it is about 5 inches long and bears evidence of having been in considerable use as it is quite blackened by burning tobacco. 3. A hat, such as is worn by Bedouin women, made of palm leaves, apparently those of the Date palm (*Phoenix dactylifera*.) 4. Two Incense Burners, one from Hadramaut the other from Oman. Each measures about 4 inches high and 2 inches square at the top. That from Hadramaut has a projecting handle on one side by which to carry it. It is made of coarse red earthenware with impressed ornamentation and has apparently been in considerable use, while that from Oman is quite new, with painted ornamentation covered with a glaze and without handle.



The interest attaching to these burners lies in the fact that they are probably used for burning Gum Olibanum or Frankincense, which is a product of Southern Arabia.

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**Pictures of the Lake.**—The lake at the southern end of the Royal Gardens is an entirely artificial creation. It was commenced about 40 years ago by the late Sir William Hooker, the then Director, who had nothing more than an old gravel pit to work upon. It was further developed by Sir Joseph Hooker, and no pains have since been spared to improve its scenic beauty. The Pinetum skirts it on its east side, and the collections of alders and willows fringe it on the north and west.

These, apart from their botanical interest, have been, as far as possible, arranged to produce a pictorial effect. This has attracted the attention of M. and Mme. de l'Aubinière who, for the last two years, have been employed in painting a series of studies and pictures from different points of view. As an inspection of a selection of these would be of interest to many visitors to the Royal Gardens, the private room in the North Gallery has been utilised for the purpose.

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**Select Extratropical Plants readily eligible for Industrial Culture or Naturalisation.**—A ninth edition of this useful work by Sir Ferdinand von Mueller, Government Botanist at Melbourne, has recently issued from the office of the Government Printer at Melbourne. This fact alone is a sufficient guarantee of the value of the book in the eyes of the public. As the title indicates, extratropical plants are dealt with; and the book may best be described as a repository of information on economic plants of all kinds, gleaned from a variety of sources. Naturally the paragraphs are of very unequal length, and some are merely suggestive. As Sir Ferdinand himself states, he has had to rely largely on the authorities from which he has drawn, and whose names he usually gives in brackets. The compiler gives the native countries of the plants; the conditions under which they grow, naturally, or are cultivated; their products or uses; their native names, and other particulars of interest or utility. Lists are also given of plants suitable for certain climates and situations. The plan of the book is alphabetical, and there is an index to vernacular names.

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**Cape Herbarium.**—The following account of the origin and history of the Cape Herbarium is reprinted from the *Cape Times* of October 16:—

The Cape Government Herbarium has its home in the upper portion of the offices of the Agricultural Department, Grave Street, and is under the charge of Professor MacOwan, the Government Botanist. The collection was originally the private selection made by Carl Zeyher for himself, from the vast quantity of specimens of Cape exsiccata, which he, at first in conjunction with Ecklon, and afterwards alone, collected and prepared for sale to European museums during a period of about 30 years. Zeyher finally visited Europe with a large quantity of scientific material, which he was anxious to place and realise. To raise funds for the voyage, he pledged his herbarium to Dr. Ludwig Pappe,



who was an enthusiastic botanist and his friend. On Zeyher's arrival in Hamburg the whole of the saleable specimens were stored in a warehouse uninsured, and by the irony of Fate were burned to ashes with the building they contained. Zeyher was helped back to the Cape by an advance from Dr. W. Sonder, and returned almost penniless. He was never able to repay either of the advances, and by a mutual understanding Pappe satisfied Dr. Sonder's claim, and increased by that amount the hypothecation on the herbarium. Ultimately Zeyher made over the collection to Dr. Pappe, who continued to study and use it daily, by the holder's hearty permission, just as if it had been still his own.

Dr. Pappe died in 1862, leaving his family in somewhat straitened circumstances and possessors of the considerable botanical library and herbaria accumulated during a long life. Unaware of the mode of exploiting either one or the other the heritors offered the library for sale at an ordinary auction, and the volumes were, with much grudging, bought by the Public Library Management at a shilling apiece. No buyer presented himself for the herbarium. At last Mr. Rawson W. Rawson, the Colonial Secretary, induced the Government to give the family 400*l.* for it. Its value then, before it had deteriorated by bad housing and years of neglect, might have been about 1,200*l.* It was stored away, now in one place and now in another, much as oathay is stored, and suffered from the inevitable insects which prey on dried plants and also from rain dripping through the roof of its presumed shelter. Then it was at Dr. J. C. Brown's suggestion, housed in a room over the Grey Library, and was at least dry. Dr. Harvey was apprised of the Government acquisition, and in 1864 offered to use it in the preparation of his *Flora Capensis*, and select and mount from it a study series of autographically certified types. This he did to the end of Volume III., when the work was cut short by his premature death. Subsequently the collection was returned to the Cape, and this study set was lodged in seven cabinets of the Kew pattern, under direction of Mr. Brown.

As nothing was being done for the collection, not even sublimating the typical study-set to prevent insect raids, Professor MacOwan, who was then living in Graham's Town, addressed Sir Philip Wodehouse on the subject in 1867, pointing out that nothing had been done for its preservation. The collection was no longer in charge of Dr. Brown, whose office of Colonial Botanist had been abolished, and it appeared to be nobody's business to do anything for it, as Mr. Trimen of the South African Museum refused to take it in charge. Professor MacOwan offered to house it at his own expense under control of the Albany Museum, and to supply the needful cabinets at his own charges. The reply was that it was not desirable to transfer the collection to the Eastern Provinces. East and West differences were then very pronounced. The collection was therefore placed in charge of Mr. James McGibbon, the gardener, but when Sir Henry Barkly succeeded Sir Philip Wodehouse, Mr. MacOwan, knowing him to be a well-informed amateur botanist, renewed his application. Sir Henry Barkly, without giving any notice to the custodian, asked to see the collection, and when displayed it was found that insect industry had destroyed scores of Harvey's valuable types. He took care, however, that the custodian should immediately treat the whole study-set in the proper manner with sublimate, so as to stop any further mischief, and generally kept things up to the mark by occasional inspections.

In February 1881, Mr. MacOwan was appointed curator, in addition to the duty of director of the Botanic Gardens. Nine new cabinets were



at once added and filled, and these were increased subsequently by seven. The new curator added his private herbarium of European plants, numbering some 5000 sheets. Until the removal of the collection to the new Agricultural Offices in Grave Street, the herbarium housing arrangements were very inadequate and inconvenient. There is not much to complain of now, though the Government Botanist, in his anxiety for his charge and his scientific enthusiasm, could doubtless point out some shortcomings. It is not very accessible, indeed at the top of the building, and there is always a dread of the recurrence of the catastrophe which overtook Zeyher's collection in Hamburg. Some day, perhaps, it may be removed to a new and truly public museum, into which students will be encouraged and tempted to enter by the very aspect of the building itself.

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**Camphor.**—The increased demand for this substance, which is obtained by distillation from the wood of *Cinnamomum Camphora*, a tree of Japan and China, has led to inquiries being addressed to Kew as to its extended cultivation in the Colonies. It grows freely in Southern Europe and is suitable for planting in any warm temperate climate.

The following note is extracted from the *British North Borneo Herald*, for September 16 :—

“Nearly 20 years ago Formosa camphor was quoted at \$20 per picul, but from various causes, chiefly owing to the invention of smokeless gunpowder, in the manufacture of which it is largely used, the price has now risen to \$79. In this connection it is a curious fact to note that camphor which discharges a large volume of carbon during combustion should produce a smokeless compound.”

The cause assigned for the rise of price proves to be erroneous, as will be seen from the following note for which Kew is indebted to Sir Frederick Abel.

SIR FREDERICK ABEL TO ROYAL GARDENS, KEW.

Imperial Institute, Imperial Institute Road,  
London, S.W.,

DEAR MR. THISELTON-DYER,

November 16, 1895.

ANY increase of demand, involving a rise in the price of camphor is not due to its application as a constituent of smokeless powder. That material *was* used in the earliest days of the manufacture of a successful smokeless powder for artillery and small arms; but its employment was soon demonstrated to be attended with serious practical disadvantages, and its application for this purpose can therefore not be said to have been other than experimental, and of no great importance, even at that time, as affecting the market value of camphor.

This substance has, however, been used extensively for many years past, and no doubt in continually increasing quantities, for the conversion of collodion cotton into the material known as *Celluloid*, which is applied to the manufacture of imitation ivory, tortoise-shell, horn, and a great variety of purposes.

W. T. Thiselton-Dyer, Esq.,  
C.M.G., C.I.E., F.R.S.,  
Royal Gardens, Kew.

Yours sincerely,  
(Signed) F. A. ABEL.



**Shade Tree for Coffee.**—A tree that is highly esteemed as a shade for coffee in the Republic of Colombia is described in the following extract from an interesting letter addressed to Kew by Mr. R. B. White, dated Palmira, August 6th, 1895. The tree has been identified as *Pithecolobium polycephalum*, Benth., *Hooker's London Journal of Botany*, lii. (1844), p. 219. It extends to tropical Brazil, and was collected near Rio Janeiro by Miers. Mr. White writes :—

“I enclose some seeds of a tree which is being used most successfully here as a shade for coffee. It has flowers in small white balls just the size of those of the Sensitive plant, pods long, flat, compressed, with 15 to 20 seeds. Pods do not open, being held together by strong marginal veins; they simply break up when rotten. No one here knows the name of this tree. I have referred it to Mr. Lehmann, and he does not know it. It is a native only of Antioquia, and grows in a mean temperature of 75° Fahr. It is fond of stony poor soil. A tree 18 months old will cover 144 square yards of ground (12 × 12). It goes to sleep at night, allowing the dew and cool air to reach the coffee. When young the wood is soft, but on ageing it gradually gets a red heart, and becomes hard and durable. The seed I send has been bathed in sulphate of copper solution, and I believe it to be good, so you can try a few seeds in Kew by way of curiosity and send the rest to one of our tropical establishments to be reported on. When full-grown this tree may be 50 feet high with a spread of at least 50 feet on all sides. Nothing can be better as a shade tree. It is a poor liver and does not exhaust the soil. It spreads out horizontally; it gives a good shade, not too dense, and during the night allows the dew to refresh the plants beneath. The leaflets do not litter the plantation and are too small to harbour fungi and moulds. It is easily trimmed and brought to shape. The umbrella ants will attack it but they can only get hold of one little sub-pinna at a time. They cannot get a good bite and cut out a real imposing umbrella and so they do not care to draw much on this tree when once they have balanced up working expenses and output. This is an advantage.”

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**Crop of Cider Apples.**—A correspondent in Gloucestershire writes :—

Cider apples are so abundant here that they fetch only 1s. a sack. Eight sacks make 100 gallons of cider, therefore 1s. will produce about 12 gallons of cider, or 1d. a gallon. Double this for making, casks, profit, &c., and you arrive at  $\frac{1}{2}$ d. per quart. There is a lot of drinking in store for those who require it. About  $1\frac{1}{2}$ d. will make a man drunk if three quarts of acrid liquor will do the job.

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